Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently amended) A method for producing a control ~~output~~signal associated with controlling a plant, comprising:

identifying an error signal associated with a difference between a set point and an output signal from the plant;

decomposing the error signal into a plurality of error signal components, a sum of the plurality of error signal components being equal to the error signal, the plurality of error signal components being determined based on a plurality of orthogonal functions representing multi-resolution decomposition properties;

transforming each error signal component to provide a corresponding plurality of control signal components; and

summing the ~~transformed~~ plurality of control signal components to ~~determine a~~ form the control signal.

2. (Original) The method of claim 1, wherein the plurality of orthogonal functions include at least one function describing wavelets.

3. (Currently amended) The method of claim 1, wherein transforming includes differentiation of at least one error signal component.

4. (Currently amended) The method of claim 1, wherein transforming includes integration of at least one error signal component.

5. (Currently amended) The method of claim 1, wherein transforming includes scaling of at least one error signal component.

6. (Currently amended) The method of claim 1, wherein transforming includes applying a linear function to at least one error signal component.

7. (Currently amended) The method of claim 1, wherein transforming includes applying a non-linear function to at least one error signal component.

8. (Currently amended) The method of claim 1, wherein the control signal is ~~determined~~ formed in real time.

9. (Currently amended) The method of claim 1, wherein one of the error signal components is the differential of the error signal using Daubechies wavelets.

10. (Original) The method of claim 1, wherein identifying an error signal includes receiving the error signal.

11. (Currently amended) The method of claim 1, wherein the plurality of ~~transformed~~ control signal components includes each of a low, intermediate and high scale component.

12. (Original) The method of claim 1, wherein the control signal may be represented as:

$$u = K_H * f_H(e_H) + K_{M_1} * f_{M_1}(e_{M_1}) + \ldots + K_{M_{N-1}} * f_{M_{N-1}}(e_{M_{N-1}}) + K_L * f_L(e_L)$$

13. (Original) The method of claim 12, wherein each function $f_i(.)$ can be a linear or a non-linear function.

14. (Currently amended) The method of claim 12, wherein each control signal component is a function of time and frequency.

15. (Currently amended) The method of claim 12, wherein the plurality of control signal components includes (de/dt)Kd, and Kp.

16. (Currently amended) The method of claim 15, wherein summing the ~~scaled~~ plurality of control signal components includes summing only (de/dt)Kd, and Kp to emulate a PD controller output.

17. (Currently amended) The method of claim 12, wherein the plurality of ~~transformed~~ control signal components includes (de/dt)Kd, (1/s)Ki, and Kp.

18. (Currently amended) The method of claim 17, wherein summing the ~~transformed~~ plurality of control signal components includes summing (de/dt)Kd, (1/s)Ki and Kp to emulate a PID controller output.

19. (Currently amended) A system for producing a control ~~output~~signal associated with controlling a plant, comprising:

means for identifying an error signal associated with a difference between a set point and an output signal from the plant;

means for decomposing the error signal into a plurality of error signal components, a sum of the plurality of error signal components being equal to the error signal, the plurality of error signal components being determined based on a plurality of orthogonal functions representing multi-resolution decomposition properties;

means for transforming each error signal component to provide a corresponding plurality of control signal components; and

means for summing the ~~transformed~~ plurality of control signal components to ~~determine a~~ form the control signal.

20. (Currently amended) The system of claim 19, wherein the means for decomposing the error signal into a plurality of error signal components employs at least one function describing wavelets.

21. (Currently amended) The system of claim 19, wherein the means for transforming includes means for differentiating at least one error signal component.

22. (Currently amended) The system of claim 19, wherein the means for transforming includes means for integrating at least one error signal component.

23. (Currently amended) The system of claim 19, wherein the means for transforming includes means for scaling at least one error signal component.

24. (Currently amended) The system of claim 19, wherein the means for transforming includes means for applying a linear function to at least one error signal component.

25. (Currently amended) The system of claim 19, wherein the means for transforming includes means for applying a nonlinear function to at least one error signal component.

26. (Original) The system of claim 19, wherein the means for decomposing produces the differential of the error signal using Daubechies wavelets.

27. (Original) The system of claim 19, wherein the means for identifying an error signal includes means for receiving the error signal.

28. (Original) The system of claim 19, wherein the means for transforming produces each of a low, intermediate and high scale component.

29. (Original) The system of claim 19, wherein the control signal may be represented as:

$$u = K_H * f_H(e_H) + K_{M_1} * f_{M_1}(e_{M_1}) + \ldots + K_{M_{N-1}} * f_{M_{N-1}}(e_{M_{N-1}}) + K_L * f_L(e_L)$$

30. (Original) The system of claim 29, wherein each function $f_i(.)$ can be a linear or a non-linear function.

31. (Currently amended) The system of claim 29, wherein the means for ~~decomposing~~ transforming produces a plurality of control signal components including (de/dt)Kd, and Kp.

32. (Original) The system of claim 31, wherein means for transforming produces (de/dt)Kd, and Kp to emulate a PD controller output.

33. (Currently amended) The system of claim 29, wherein the means for transforming each error signal component[[s]] produces (de/dt)Kd, (1/s)Ki, and Kp.

34. (Original) The system of claim 33, wherein the means for summing sums (de/dt)Kd, (1/s)Ki and Kp to emulate a PID controller output.

35. (Currently amended) An apparatus for producing a control ~~output~~signal associated with controlling a plant, comprising:

a processor; and

a memory operatively connected to the processor, said memory storing control logic for directing the processor to:

identify an error signal associated with a difference between a set point and an output signal from the plant;

decompose the error signal into a plurality of error signal components, a sum of the plurality of error signal components being equal to the error signal, the plurality of error signal components being determined based on a plurality of orthogonal functions representing multi-resolution decomposition properties;

transform each error signal component to provide a corresponding plurality of control signal components; and

sum the ~~transformed~~ plurality of control signal components to ~~determine a~~ form the control signal.

36. (Currently amended) A computer-readable storage medium encoded with processing instructions for producing a control ~~output~~signal associated with controlling a plant, the processing instructions for directing a computer to perform the steps of:

identifying an error signal associated with a difference between a set point and an output signal from the plant;

decomposing the error signal into a plurality of error signal components, a sum of the plurality of error signal components being equal to the error signal, the plurality of error signal components being determined based on a plurality of orthogonal functions representing multi-resolution decomposition properties;

transforming each error signal component to provide a corresponding plurality of control signal components; and

summing the ~~transformed~~ plurality of control signal components to ~~determine a~~ form the control signal.